

**UNITED STATES PATENT APPLICATION**

**OF**

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**FOR**

**DRUM TYPE WASHING MACHINE AND  
APPARATUS FOR WATER SUPPLY THEREOF**

[0001] This application claims the benefit of Korean Application(s) No. 10-2002-0075018 filed on November 28, 2002, which is/are hereby incorporated by reference.

## BACKGROUND OF THE INVENTION

### 5 Field of the Invention

[0002] The present invention relates to an apparatus for water supply of a drum type washing machine, and more particularly, to a drum type washing machine and apparatus for water supply thereof, by which an inlet hose is prevented from being frozen to breakage.

### Discussion of the Related Art

10 [0003] Generally, in a drum type washing machine, the laundry, detergent, and water are put in a drum installed slant or horizontal and the drum is then rotated by a motor to perform washing using a friction between a current and the laundry. Hence, the washed laundry is almost damage-free, avoids entanglement thereof, and undergoes the washing effects of beating and rubbing.

15 [0004] FIG. 1 is a cross-sectional view of a drum type washing machine according to a related art and FIG. 2 is a perspective view of a drum type washing machine according to a related art, in which a top is open.

[0005] Referring to FIG. 1, a drum type washing machine according to a related art consists of a base plate 1, a cabinet 2, a tub 4, a drum 6, a motor 8, lifters 10, a front panel 12,  
20 a door 13, a top plate 14, and a control panel 16.

[0006] The base plate 1 is provided to form a bottom of the washing machine, and the cabinet is provided on the base plate 1 to have open front, top, and bottom sides, The tub 4 and drum 6 are provided in the cabinet 2 to hold water and/or laundry. The motor 8 is provided in rear of the tub 4 to be connected to the drum 6 through a shaft. The lifters 10 are

provided in the drum 6 to lift up the laundry to a predetermined height when the drum rotates. The front panel 12 is provided on the front side of the cabinet 2 to have an opening through which the laundry is put in or picked out. The door 13 is rotatably provided to the front panel 12 to open/close the opening. The top plate 14 is provided on the cabinet 2, and the control panel 16 is provided on the front panel 12 to hold various control parts for controlling an operation of the washing machine.

[0007] Referring to FIG. 2, a water supply assembly 20 for supplying water required for washing or rinsing the laundry is provided to the drum type washing machine. The water supply assembly 20 consists of a detergent box 24, an inlet valve 28, and an inlet hose 32.

[0008] The detergent box 24 is installed under a front side of the top plate 14, and includes a passage of water and detergent to supply the tub 4 with the water and detergent via an inlet bellows 26. The inlet valve 28 is installed at an upper rear side of the cabinet 2 to switch the supplied water. And, the inlet hose 32 is connected between the detergent box 24 and the inlet valve 28 to lead the water to the detergent box 24.

[0009] In this case, one end of the inlet hose 32 is connected to a hose connecting portion 25 protruding from a rear side of the detergent box 24 and the other end of the inlet hose 32 is connected to a hose connecting portion 29 protruding from a front side of the inlet valve 28.

[0010] Meanwhile, a perforated hole 2a is formed at the rear side of the cabinet 2. In this case, another hose connecting portion 31 for connecting an external hose 30 to the inlet valve 28 passes through the perforated hole 2a.

[0011] When the drum type washing machine operates, the water from the service pipe passes the inlet valve 28, inlet hose, 32, and detergent box 24 in order and then flows in the tub 4 and the drum 6.

[0012] However, in the related art water supply assembly 20 of the drum type washing machine, the hose connecting portion 25 of the detergent box 24 is disposed at a level equal to or higher than that of the hose connecting portion 29 of the inlet valve 28. Hence, the water remains in the inlet hose 32 becomes frozen in cold weather, thereby  
5 breaking the inlet hose 32.

#### SUMMARY OF THE INVENTION

[0013] Accordingly, the present invention is directed to a drum type washing machine and apparatus for water supply thereof that substantially obviates one or more of the problems  
10 due to limitations and disadvantages of the related art.

[0014] An object of the present invention, which has been devised to solve the foregoing problem, lies in providing a drum type washing machine and apparatus for water supply thereof, by which an inlet hose is prevented from being frozen to breakage.

[0015] Additional features and advantages of the invention will be set forth in the  
15 description which follows, and in part will be apparent to those having ordinary skill in the art upon examination of the following or may be learned from a practice of the invention. The objectives and other advantages of the invention will be realized and attained by the subject matter particularly pointed out in the specification and claims hereof as well as in the appended drawings.

[0016] To achieve these objects and other advantages in accordance with the present  
20 invention, as embodied and broadly described herein, there is provided an apparatus for water supply of a drum type washing machine including an inlet valve selectively supplying or cutting off water, a second hose connecting portion provided at the inlet valve, a detergent box storing a detergent and having a water/detergent passage inside, a first hose connecting

portion provided at the detergent box, and an inlet hose having one end connected to the second hose connecting portion and the other end connected to the first hose connecting portion, wherein the second hose connecting portion is disposed higher than the first hose connecting portion.

5       **[0017]**     In this case, the inlet hose is formed of a stiff material. And, the inlet hose is provided slant like a straight line.

**[0018]**     Moreover, the inlet hose can be bent to be provided partially slant.

**[0019]**     Meanwhile, the second hose connecting portion is a pipe protruding from one front side of the inlet valve. In this case, the second hose connecting portion is preferably built  
10    in one body of the inlet valve.

**[0020]**     Moreover, the first hose connecting portion is a pipe protruding from one rear side of the detergent box. In this case, the first hose connecting portion is preferably built in one body of the detergent box.

**[0021]**     In another aspect of the present invention, there is provided a drum type  
15    washing machine including a tub holding water, a drum rotatably installed in the tub, an inlet valve selectively supplying or cutting off the water, a second hose connecting portion provided at the inlet valve, a detergent box storing a detergent and having a water/detergent passage inside, a first hose connecting portion provided at the detergent box, and an inlet hose having one end connected to the second hose connecting portion and the other end connected  
20    to the first hose connecting portion, wherein the second hose connecting portion is disposed higher than the first hose connecting portion.

**[0022]**     It is to be understood that both the foregoing explanation and the following detailed description of the present invention are exemplary and illustrative and are intended to provide further explanation of the invention as claimed.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0023] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

[0024] FIG. 1 is a cross-sectional view of a drum type washing machine according to a related art;

[0025] FIG. 2 is a perspective view of a drum type washing machine according to a related art, in which a top is open; and

[0026] FIG. 3 is a cross-sectional view of a drum type washing machine according to the present invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0027] Reference will now be made in detail to the preferred embodiment(s) of the present invention, examples of which are illustrated in the accompanying drawings. Throughout the drawings, like elements are indicated using the same or similar reference designations where possible.

[0028] FIG. 3 is a cross-sectional view of a drum type washing machine according to the present invention.

[0029] Referring to FIG. 3, a drum type washing machine according to the present invention includes a base plate 51, a cabinet 52, a tub 54, a drum 56, a motor 58, lifters 60, a front panel 62, a door 63, a top plate 64, a water supply assembly 70, a drain assembly 90, and a control panel 100.

[0030] The base plate 51 is provided to form a bottom of the washing machine, and the cabinet 52 is provided on the base plate 51 to have open front, top, and bottom sides. The tub 54 and drum 56 are provided in the cabinet 52 to hold water and/or laundry. The motor 58 is provided in rear of the tub 54 to be connected to the drum 56 through a shaft. The lifters 60 are provided in the drum 56 to lift up the laundry to a predetermined height when the drum rotates.

[0031] The front panel 62 is provided on the front side of the cabinet 52 to have an opening through which the laundry is put in or picked out. The door 63 is rotatably provided to the front panel 62 to open/close the opening. The top plate 64 is provided on the cabinet 52. And, the control panel 100 is provided on the front panel 62 to hold a control unit for controlling an operation of the washing machine.

[0032] The water supply assembly 700 for supplying water required for washing or rinsing the laundry to the tub 54 is provided to the drum type washing machine. The drain assembly 90 is provided on the base plate 51 to drain the water in the tub 54. And, the control unit for controlling an operation of the washing machine is installed in the control panel 100.

[0033] The drum type washing machine washes, rinses, and dewateres the laundry in a manner that the drum 56 is driven to rotate in the tub 54 by the motor 58.

[0034] Meanwhile, the water supply assembly 70 includes an inlet valve 72, a detergent box 76, and an inlet hose 82.

[0035] In this case, the inlet valve 72 is turned on/off to open/close a passage of the externally supplied water according to a control signal of the control unit provided to the control panel 100. And, the detergent box 76 stores the detergent therein and is provided as a passage of the water and detergent. Namely, the water passes the detergent box 76 to be mixed with the detergent, and the water and detergent are then supplied to the tub 54 via an inlet

bellows 75.

[0036] Meanwhile, one end of the inlet hose 82 is connected to a second hose connecting portion 74 formed at the inlet valve 72 and the other end of the inlet hose 82 is connected to a first hose connecting portion 78 formed at the detergent box 7. Hence, the inlet  
5 hose 82 leads the water supplied from the inlet valve 72 to the detergent box 76.

[0037] In this case, a height  $h_1$  of the second hose connecting portion 74 connected to the inlet valve 72 is provided higher than a height  $h_2$  of the first hose connecting portion 78 connected to the detergent box 76. Hence, the inlet hose 82 is provided slant between the first and second hose connecting portions 78 and 74 with a predetermined slope. Hence, the water  
10 in the inlet hose 82 naturally flows in the detergent box 76, thereby failing to remain in the inlet hose 82.

[0038] The first hose connecting portion 78 is formed like a pipe protruding from one rear side of the detergent box 76 and is built in one body of the detergent box 76. Moreover, the second hose connecting portion 74 is formed like a pipe protruding from one front side of  
15 the inlet valve 72 and is built in one body of the inlet valve 72.

[0039] Besides, the inlet hose 82 may be formed of a flexible material. Instead, in order to prevent the inlet hose 82 from drooping like a 'U' shape due to weight of the water, the inlet hose 82 is preferably formed of a stiff material.

[0040] And, the inlet hose 82 can be provided as a slant straight line between the first  
20 and second hose connecting portions 78 and 74.

[0041] Moreover, the inlet hose 82, as shown in FIG. 3, can be partially bent to be installed slant in the washing machine.

[0042] The inlet valve 72 is installed at the rear side of the cabinet 52 through a screw or hook, and a third hose connecting portion 73 is provided at a hole 52a formed at an upper



rear side of the cabinet 52. A rear end of the third hose connecting portion 73 is connected to a hose 88 connected to a service pipe, and a front end of the third hose connection portion 73 is a portion of the second hose connecting portion 74 protruding like a pipe so that one end of the inlet hose 82 is fitted thereto.

5       **[0043]**     Moreover, the first hose connecting portion 78 protrudes like a pipe from a lower rear side of the detergent box 76 so that the other end of the inlet hose 82 is fitted thereto.

**[0044]**     An operation of the water supply assembly of the drum type washing machine according to the present invention is explained as follows.

10       **[0045]**     First of all, once the drum type washing machine operates to turn on the inlet valve 72, the water passes the inlet valve 72, inlet hose 82, detergent box 76, and inlet bellows 75 in turn via the external hose 88 and then flows in the tub 4 and the drum 6.

**[0046]**     Since the second hose connecting portion 74 of the inlet valve 72 is disposed higher than the first hose connecting portion 78 of the detergent box 76, the water passing  
15     inside the inlet hose 82 enables to smoothly flow in the detergent box 76. Moreover, the water lingering in the inlet hose 82 naturally flows toward the first hose connecting portion 78 of the detergent box 76, thereby completely flowing into the detergent box 76.

**[0047]**     Accordingly, the apparatus for water supply of the drum type washing machine according to the present invention has the following advantages or effects.

20       **[0048]**     First of all, the first hose connecting portion of the inlet valve connected to one end of the inlet hose is disposed higher than the second hose connecting portion of the detergent box connected to the other end of the inlet hose. Hence, the water flowing inside the inlet hose is immediately supplied to the detergent box and fails to remain in the inlet hose, whereby the inlet hose is prevented from being frozen to breakage.

[0049] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover such modifications and variations, provided they come within the scope of the appended claims and their equivalents.